Amendments to the Specification:

Please replace the paragraph on page 5, line 12 with the following amended paragraph:

Figures 2 and 3 illustrate ~~depicts~~ a preferred embodiment of the present invention.

Please replace the paragraph beginning on page 5, line 13 and ending on page 5, line 22 with the following amended paragraph:

Figure 1 illustrates the functional blocks of an example sensor of the present invention. The microsensor is built up from three physically free-standing elements: These are [[an]] a sensor element 1, which includes the basic sensor function, an application specific integrated circuit (ASIC) 2, including means for transferring the sensor ~~infonnation~~ information into an electronic signal, and a package 3, enabling environmental protection of elements 1 and 2 with maintained sensing function as well as means for access to the surrounding gas atmosphere or other measuring points, and communicating electrical signals to external systems. The sensor element 1 makes use of a differential arrangement, with two nearly identical channels, operating in parallel.

Please replace the paragraph beginning on page 7, line 10 and ending on page 7, line 18 with the following amended paragraph:

As indicated in Figure 1, the signal conversion from the physical to the electronic domain takes place in a pair of physically separated, but nearly identical resonators 4, 5. Micro-acoustic resonators may be defined using principles established by Kundt and Helmholtz ~~the~~ this century. A Kundt resonator is defined by standing waves due to reflection, and the standing wave pattern

will be dependent on the sound velocity according to well-known relations. Standing waves between solid walls a millimeter apart will occur at multiples of 170 kHz (assuming c=340 m/s), and the frequencies will slightly shift following the entrance of a pollutant. The quality factor of the resonance will depend on a number of factors, such as influence from scattering and absorption.

Please replace the paragraph beginning on page 7, line 19 and ending on page 8, line 4 with the following amended paragraph:

A Helmholtz resonator is built up by the combination of a pair of compliant and inertial elements, such as a volume cavity and a neck. The angular resonance frequency is linearly related to the velocity of sound c, with a proportionality constant determined by the device geometry:

$\omega_r = c(S/lV)^{1/2}$

where V is the volume of the cavity, and S and I are the area and length of the neck. respectively. Setting V=0.1 mm.sup.3, S=0.01 mm.sup.2, and t=0.1 mm gives f.sub.r=w.sub.r/2.pi.=54 kHz, again assuming c=340 m/s. By proper dimensioning of V, S and I, it is thus possible to `tune` a microacoustic resonator to a desired operating frequency, and it is also possible to fine tune one resonator to another, matching them to provide zero frequency difference when exposed to an identical gas mixture. A third way to implement a resonator is to use a compliance-inertance pair in the form of a spring-mass combination, which, analogous to the Helmholtz resonator, will exhibit a natural vibrating frequency determined by the mass and the spring constant. [[if]] <u>If</u> the mass element consists of a highly perforate structure, the effective mass will also include a certain amount of air `dragged` by the vibrating mass which will add to the mass determining the

resonant frequency. In this case, the resonant frequency will be related to the density of air, rather than the velocity of sound.

Please replace the paragraph beginning on page 8, line 19 and ending on page 8, line 32 with the following amended paragraph:

The sensor element 1 also includes means for excitation 6, 7 and detection 8, 9 of the resonators 4, 5. Imposing acoustic or mechanical vibrations may be performed by piezoelectric, electrostatic, electrothermal elements. For detection, piezoelectric, capacitive or piezoresistive elements may be used. The choice is governed both by the efficiency of transformation, and by the compatibility with fabrication methods. Piezoelectric materials [[arc]] <u>are</u> not included in standard semiconductor processes, and do not represent a first hand choice on these grounds. Electrostatic excitation and capacitive detection methods are compatible with many MEMS manufacture processes, and are ~~favourable~~ <u>favorable</u> with respect to power consumption. On the other hand, unless high drive voltage is acceptable, the excitation structure must be extremely thin, imposing high demands on the manufacture process. Electrothermal or resistive excitation ('Joule heating') and piezoresistive detection are both compatible with standard MEMS processes, by integrating diffused or thin film resistors in the device structure, and will provide adequate power efficiency and detectability.

Please replace the paragraph beginning on page 11, line 10 and ending on page 11, line 15 with the following amended paragraph:

~~Figure 2 illustrates~~ <u>Figures 2 and 3 illustrate</u> an embodiment of a sensor according to the invention. The basic modules of the sensor element 1, the ASIC 2 and the package 3 are clearly discernible. The package 3 is welded or glued together from an upper and lower lid structure, to

which a lead frame 22 is attached. Thin wires 23 are bonded to interconnecting pads on the sensor element 1 and the ASIC 2, and connected to the lead frame 22.

Please replace the paragraph beginning on page 11, line 28 and ending on page 12, line 5 with the following amended paragraph:

The gas permeability of solid walls of different materials may vary by as much as eight orders of magnitude. Glass, ceramics and most metals could be considered impermeable in all practical aspects discussed here. Such materials may therefore be used for designing an absolute reference channel, according to the discussion above. Polymer or elastomer membranes which are more or less permeable to gases may be used as filter elements for the measuring channel and a floating reference. Between different materials and filter dimensions, it is possible to predetermine the permeability and thus set it to the desired response time, in the case of the measuring channel, or the averaging time constant, in the case of the floating reference channel`. More elaborately, by using micro-valves to close or open certain paths for gas permeation, the corresponding ~~penneabilibes~~ permeabilities and time constants could be controlled in real time.